

DETERMINANTS OF CONTAMINANTS IN HUMAN MILK IN THE NETHERLANDS IN 1988

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The exposure of nursed babies to polychlorinated organic compounds through human milk are regularly being monitored. A reason being that the exposure levels are estimated to exceed those acceptable as a lifelong daily dose. Nevertheless, mothers are still positively advised as to breastfeeding. Another interest was in the determinants of the levels in human milk.

In 1988 a survey on contaminants in human milk was carried out in a repeat design of a 1983 survey but with extended questionnaire information on determinants. Residues of polychlorinated organic compounds (**PCOs**), polychlorobiphenyls (**PCBs**), dioxins and furans were measured. Thirty maternity centres were selected; in each centre 12 women, planning on breastfèeding and willing to cooperate, were asked to participate. Questionnaire information on residential history, dietary practices, occupation, previous pregnancies and previous breastfeeding periods was obtained. The estimated response amounted to 69 percent. In total 329 questionnaires and 319 samples were analyzed. The respondents mean age was 10 years, the duration of their pregnancies ranged between 36 and 42 weeks. The respondents had on average, including the new-born infant two children. The newborns weighted on average 3500 grams, their mothers had a mean post-pregnancy Quetelet Index of 24 kg/m². The cumulated number of months that previous children were breastfed was eight on average.

Levels of PCBs were lower in the Netherlands compared to levels measured in the northern part of Belgium. Dioxin levels in Dutch mother's milk were in accordance with levels found in Belgian, German and English milk samples. Although the levels in these countries were higher than the levels published by other European and non-European countries, values remained within the range of analytical variance.

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Multiple regression and analysis of covariance were used to establish associations between determinants and specific contaminants. The percentage of milk fat was positively associated with the concentration of PCOs in mother's milk. Furthermore, a clearly negative association was found between the concentration of PCOs and the total number of breastfed children or the cumulated lactation period. Traditional omnivorous diet was associated with higher concentrations of PCOs when compared to all other types of diet. Fish consumption, post-pregnancy Quetelet Index and maternal age were positively associated with concentrations of PCOs. Out of the eight PCBs tested, two congeners were found to be negatively associated with duration of pregnancy.

Most of the associations described above are in accordance with prior knowledge on chemical behaviour and environmental distribution patterns of the PCOs measured in this study. In the near future maternal age is expected to rise and the duration of lactation will most probably decline. As a consequence, concentrations of PCOs in human milk will possibly increase. For the moment, the known benefits of breastfeeding will probably still outweigh possible adverse effects of milk contaminated with polychlorinated organic compounds.